

**Remarks**

Support for the above-requested amendments to claim 1 is found at least on page 2, lines 25-29, page 4, lines 6-8, and page 7, lines 6-7. Support for the amendments to claim 9 is found at least on page 2, lines 25-29, page 4, lines 6-8, and page 7, lines 1-7. Claim 29 has been amended to change the dependency of the claim. Claim 28 has been canceled without prejudice. Claims 4, 16, 20, and 24 were canceled without prejudice in previous Amendments. No question of new matter arises and entry of the above-requested amendments is respectfully requested.

Claims 1-3, 5-15, 17-19, 21-23, 25-27, and 29-31 are before the Examiner for consideration.

**Rejection Under 35 U.S.C. §103(a)**

Claims 1-3, 5-8, and 22 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,228,785 to Miller, *et al.* ("Miller") in view of U.S. Patent No. 4,265,563 to Marzocchi *et al.* ("Marzocchi"). The Examiner asserts that Miller teaches an asphalt-based roofing material that includes a glass fiber substrate coated with asphalt and a surface layer of granules embedded in the asphalt coating. The Examiner admits that Miller fails to disclose the use of a silane-sizing agent for the glass fibers in the asphalt.

In this regard, the Examiner asserts that Marzocchi teaches that glass fibers can be treated with a silane coupling composition along with sulfur, leaving secondary or primary as well as elemental sulfur dispersed on the surface of the glass fibers. It is asserted that the sulfur content of the silane coating may be from 0.05 to 40%, with a preference from 0.1 to 7%. The Examiner further asserts that a wear layer including an aggregate and asphalt mixture overlays the substrate layer. In addition, the Examiner asserts that in one embodiment, a glass flake layer is added on top of the substrate. The Examiner concludes that it would have been obvious to one of skill in the art to modify the glass fiber mat of Miller with the silane sizing agent of Marzocchi to improve the adhesion between the fiber glass and the asphalt.

**Applicants' Response**

In response to this rejection, Applicants respectfully direct the Examiner's attention to the amendments made to independent claim 1 and submit that claim 1 defines a roof covering that is not taught or suggested within Miller and Marzocchi. In addition, Applicants submit that Miller and Marzocchi fail to teach the combination of features recited in claim 1.

Marzocchi teaches a surface treatment for glass flakes or glass fibers that includes a mixture of amino silane and elemental sulfur. (*See, e.g.*, column 9, lines 35-40). This treatment leaves unreacted primary or secondary amine groups and elemental sulfur dispersed over the glass surface. (*See, e.g.*, column 9, lines 40-42). These teachings in Marzocchi may be contrasted to the claimed invention where glass fibers are sized with a sizing that includes a film forming polymer, a coupling agent, a lubricant, and a sulfur-containing material that has therein sulfur groups that form cross-links with asphalt present in a coating material. Nowhere in Marzocchi is there any teaching or suggestion of a sulfur-containing material or a sizing composition that includes such a sulfur-containing material. Applicants respectfully submit that the inclusion of elemental sulfur in a mixture with an amino silane is vastly different from a sulfur-containing material that has therein sulfur groups.

In addition, Applicants submit that there is not any teaching or suggestion within Marzocchi of cross-linking sulfur groups present within a sulfur-containing compound to asphalt. In Marzocchi, the elemental sulfur is simply dispersed on the glass surface. (*See, e.g.*, column 9, lines 40-42). Miller is silent with respect to any teaching or suggestion of a sizing composition containing a sulfur-containing material. Therefore, it is respectfully submitted that the combination of Miller and Marzocchi would not result in the roof covering of claim 1. Accordingly, Applicants respectfully submit that claim 1 is non-obvious and patentable.

Additionally, Applicants respectfully submit that there is no motivation for one of skill in the art to arrive at a roof covering based on the teachings of Miller and Marzocchi. To establish a *prima facie* case of obviousness, there must be some motivation, either within the reference or in the knowledge of those of skill in the art, to modify the reference or combine the references' teachings, there must be a reasonable expectation of success, and the prior art references must meet all of the claim limitations. (*See, e.g., Manual of Patent Examining Procedure*, Patent Publishing, LLC, Eighth Ed., Rev. 6, August 2007, §2142).

It is respectfully submitted that one of ordinary skill in the art would have no motivation to arrive at a roof covering based on the teachings of Miller and Marzocchi. Marzocchi simply does not teach or suggest glass fibers sized with a sizing that includes a film forming polymer, a coupling agent, a lubricant, and a sulfur-containing material that has therein sulfur groups that form cross-links with asphalt present in a coating material as claimed in claim 1. Miller, as discussed above, is silent with regard to any teaching or suggestion of a sizing composition containing a sulfur-containing material. Without some

teaching or suggestion, there can be no motivation, and without motivation, there can be no *prima facie* case of obviousness.

Also, as discussed above, Miller and Marzocchi, alone or in combination, do not teach or suggest glass fibers sized with a sizing that includes a film forming polymer, a coupling agent, a lubricant, and a sulfur-containing material that has therein sulfur groups that form cross-links with asphalt in a coating material. Therefore, Applicants respectfully submit that Miller and Marzocchi fail to teach all of the claim limitations set forth in claim 1.

Accordingly, it is submitted that a *prima facie* case of obviousness has not been established for this additional reason.

With respect to claims 3, 5-8, and 22, Applicants submit that because independent claim 1 is not taught or suggested by Miller and Marzocchi and claims 3, 5-8, and 22 are dependent upon claim 1 and contain the same elements as claim 1, dependent claims 3, 5-8, and 22 are also not taught or suggested Miller and/or Marzocchi.

In light of the above, Applicants submit that claims 1, 3, 5-8, and 22 are not obvious over Miller in view of Marzocchi and respectfully request that this rejection be reconsidered and withdrawn.

#### **Rejection Under 35 U.S.C. §103(a)**

Claims 1-3, 5-8, and 22 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,228,785 to Miller, *et al.* ("Miller") in view of U.S. Patent No. 4,210,459 to Williams, *et al.* ("Williams"). The Examiner asserts that Miller teaches an asphalt-based roofing material that includes a glass fiber substrate coated with asphalt and a surface layer of granules embedded in the asphalt coating. The Examiner admits that Miller fails to disclose the use of a silane-sizing agent for the glass fibers in the asphalt.

In this regard, Williams is cited for assertedly teaching the use of a polysulfide silane coupling agent for glass fibers in rubber composites. It is asserted that the coupling agent may also comprise vinyl groups (*i.e.*, a vinyl silane). The Examiner asserts that the polysulfide organosilicon coupling agent may also be added to the rubber matrix and the sulfur concentration may be from about 0.5 to 4 weight percent of the matrix. The Examiner concludes that it would have been obvious to one of skill in the art to use the sulfide silane coupling agent of Williams on the glass fibers of Miller as well as in the matrix to simplify the coating of the glass fibers to one chemical treatment and to improve the strength of the resin phase with the addition of the polysulfide silane.

### **Applicants' Response**

In response to this rejection, Applicants respectfully direct the Examiner's attention to the amendments made to independent claim 1 and submit that claim 1 defines a roof covering that is not taught or suggested within Miller and Williams. In addition, Applicants submit that Miller and Williams fail to teach the combination of features recited in claim 1.

Williams teaches a reaction product of an organic polymer, an inorganic substrate, and a polysulfide silicon composition of matter. (*See, e.g.*, column 1, lines 26-30). Williams also discloses an article of manufacture that comprises an inorganic substrate treated with the polysulfide substituted silicon compositions of matter. (*See, e.g.*, column 1, lines 34-38). Applicants respectfully submit that Williams does not, however, teach or even suggest a roof covering that includes glass fibers sized with a sizing that includes a film forming polymer, a coupling agent, a lubricant, and a sulfur-containing material that has therein sulfur groups that form cross-links with asphalt present in a coating material. Indeed, Williams is silent with respect to any teaching or suggestion of a sizing composition that includes a film forming polymer, a coupling agent, a lubricant, and a sulfur-containing material that has therein sulfur groups. It is respectfully submitted that Williams is silent with regard to the inclusion of a sizing composition at all. Applicants respectfully submit that Williams simply teaches a polysulfide silicon compound. This is simply not a sizing.

In addition, Applicants submit that there is not any teaching or suggestion within Williams of cross-linking sulfur groups present within a sulfur-containing compound to asphalt present in a coating material. There is simply no coating material, or anything equivalent to a coating material, within Williams. Williams specifically teaches the reaction of the organic polymer, inorganic substrate, and a polysulfide silicon composition to form a composite. Miller, as discussed above, is silent with respect to any teaching or suggestion of a sizing composition containing a sulfur-containing compound or of cross-linking sulfur groups to asphalt in a coating material. In view of the above, it is respectfully submitted that the combination of Miller and Williams would not result in the roof covering of claim 1. Accordingly, Applicants respectfully submit that claim 1 is non-obvious and patentable.

Additionally, Applicants respectfully submit that there is no motivation for one of skill in the art to arrive at a roof covering based on the teachings of Miller and Williams. To establish a *prima facie* case of obviousness, there must be some motivation, either within the reference or in the knowledge of those of skill in the art, to modify the reference or combine the references' teachings, there must be a reasonable expectation of success, and the prior art

references must meet all of the claim limitations. (*See, e.g., Manual of Patent Examining Procedure*, Patent Publishing, LLC, Eighth Ed., Rev. 6, August 2007, §2142).

It is respectfully submitted that one of ordinary skill in the art would have no motivation to arrive at a roof covering based on the teachings of Miller and Williams. Williams simply does not teach or suggest glass fibers sized with a sizing that includes a film forming polymer, a coupling agent, a lubricant, and a sulfur-containing material that has therein sulfur groups that form cross-links with asphalt present in a coating material as claimed in claim 1. Miller, as discussed above, is silent with regard to any teaching of a sulfur-containing material in a sizing or any suggestion of a sizing composition or of crosslinking sulfur with asphalt present in a coating material. Without some teaching or suggestion, there can be no motivation, and without motivation, there can be no *prima facie* case of obviousness.

Also, as discussed above, Miller and Williams, alone or in combination, do not teach or suggest glass fibers sized with a sizing that includes a film forming polymer, a coupling agent, a lubricant, and a sulfur-containing material that has therein sulfur groups that form cross-links with asphalt in a coating material. Therefore, Applicants respectfully submit that Miller and Williams fail to teach all of the claim limitations set forth in claim 1. Accordingly, it is submitted that a *prima facie* case of obviousness has not been established for this additional reason.

With respect to claims 2-3, 5-8, and 22, Applicants submit that because independent claim 1 is not taught or suggested by Miller and Williams and claims 2-3, 5-8, and 22 are dependent upon claim 1 and contain the same elements as claim 1, dependent claims 2-3, 5-8, and 22 are also not taught or suggested Miller and/or Williams.

In light of the above, Applicants submit that claims 1-3, 5-8, and 22 are not obvious over Miller in view of Williams and respectfully request reconsideration and withdrawal of this rejection.

#### **Rejection Under 35 U.S.C. §103(a)**

Claims 9-15, 17-19, 21, 23, 25, and 28-31 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,228,785 to Miller, *et al.* ("Miller") in view of U.S. Patent No. 4,210,459 to Williams *et al.* ("Williams") as applied to claims 1 and 6 above, and further in view of U.S. Patent No. 4,079,158 to Kennepohl, *et al.* ("Kennepohl"). The

Examiner admits that Miller and Williams fail to disclose the use of elemental sulfur in the asphalt matrix.

In this regard, Kennepohl is cited for assertedly teaching an asphalt coating that includes asphalt, mineral filler, and sulfur. It is asserted that the added sulfur extends the available asphalt while at the same time offering an improvement to the burning and fire resistance of the coated product. In addition, the Examiner asserts that the coating composition includes elemental sulfur at levels as low as 10 weight percent based upon the combination of sulfur and asphalt. The Examiner asserts that the coating composition may also include up to 50% by weight filler, which would reduce the sulfur levels to as low as 5 weight percent of the coating composition. The Examiner concludes that it would have been obvious to one of skill in the art to modify the invention of Miller with the elemental sulfur of Kennepohl to provide fire resistance to the coated product.

#### **Applicants' Response**

Initially, Applicants submit that claim 28 has been canceled without prejudice, thereby rendering the rejection of this claim moot.

In response to the rejection of the remaining claims, Applicants respectfully direct the Examiner's attention to the amendments made to independent claim 9 and submit that claim 9 defines a roof covering that is not taught or suggested within Miller, Williams, and Kennepohl. In addition, Applicants submit that Miller, Williams, and Kennepohl fail to teach the combination of features recited in claim 9.

It is respectfully submitted that none of Miller, Williams, or Kennepohl teaches or suggests the inclusion of elemental sulfur in a coating material in an amount from about 0.1% to about 2.0% by weight of the coating material as claimed in claim 9. Applicants respectfully submit that Kennepohl teaches the inclusion of 10-55% sulfur dispersed in the asphalt coating. (*See, e.g.*, the Abstract and column 2, lines 60-67). It is respectfully submitted that the amount of sulfur in the coating asphalt of Williams is vastly different, and much greater, than the amount of sulfur (0.1-2.0% by weight of the coating material) required by claim 9.

In the outstanding Office Action, the Examiner asserts that the inclusion of 50% by weight filler would reduce the sulfur levels to as low as 5 weight percent of the coating composition. (*See* page 7, lines 2-5 of the Office Action dated February 13, 2009). Even assuming, *arguendo*, that Kennepohl teaches a level of 5% by weight sulfur in the asphalt coating, this amount is still greater than the claimed amount of from 0.1 to 2.0% by weight of

the coating material. It is respectfully submitted that at either amount, *i.e.*, 10-55% as disclosed in Kennepohl or as low as 5% as suggested by the Examiner, the amount of sulfur in the asphalt is far different from, and still greater than, the claimed amount of sulfur in the coating composition. Miller and Williams are silent regarding any teaching or suggestion of the addition of elemental sulfur to a coating material. Thus, Miller and Williams cannot make up for the deficiencies of Kennepohl. Accordingly, Applicants respectfully submit that the combination of Miller, Williams, and Kennepohl will not result in the roof covering claimed in claim 9. It is respectfully submitted that claim 9 is non-obvious and patentable for at least this reason.

In addition, in the Office Action, the Examiner asserts that the relative amount of sulfur in the asphalt composition is a result effective variable affecting the extendability and the burning and fire resistance of the coated product, and that it would have been obvious to one of skill in the art to optimize this result-effective variable by routine experimentation. (*See* page 7, lines 6-11 of the Office Action dated February 13, 2009). Although Applicants respectfully disagree with the Examiner's assertion, Applicants respectfully submit that one of skill in the art desiring fire resistance in their shingles, as suggested by the Examiner, would add higher amounts of sulfur, as sulfur is known to provide shingles with greater fire resistance. (*See, e.g.*, column 2, lines 39-51 of Kennepohl). One of skill in the art would not be motivated to use less sulfur, or sulfur in a small quantity such as from 0.1 to 2.0% by weight as claimed to achieve optimized fire protection. Moreover, it is respectfully submitted that the amount of sulfur in Kennepohl is not an optimizable property as Kennepohl clearly and specifically provides ranges for the included sulfur.

Additionally, Applicants respectfully submit that to evaluate the obviousness or non-obviousness of an invention, both the prior art reference(s) and the claimed invention as a whole must be considered. (*See, e.g., Manual of Patent Examining Procedure*, Patent Publishing, LLC, Eighth Ed., Rev. 3, August 2005, §2141.02 citing *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983) and *Schenck v. Nortron Corp.*, 713 F.2d 782, 218 USPQ 698 (Fed. Cir. 1983)). Looking at Kennepohl as a whole, it is clear that Kennepohl teaches the inclusion of sulfur in a coating asphalt in an amount from 10-55% by weight sulfur. Applicants note that both in the specification and in the Examples, Kennepohl teaches that the sulfur is present in the asphalt coating in an amount far greater than 2.0% by weight.

It is respectfully submitted that one of skill in the art would look not only to the specification, but also to the Examples of Kennepohl for guidance in forming a size composition, and in each of the Examples, sulfur was present in the asphalt coating in an amount of 25% by weight. (*See, e.g.*, column 4, lines 20-23). In addition, Kennepohl utilized samples of asphalt that included 10, 25, or 50% by weight sulfur. (*See, e.g.*, Example 2 at column 6, lines 15-23). It can be seen in Example 2 that at 10% by weight sulfur, a larger amount of consumable weight of the shingle was lost as compared to samples containing 25% and 50% sulfur by weight. (*See, e.g.*, column 7, lines 21-35). Shingles that contained no sulfur lost the greatest amount, which was between 67 and 85% of their consumable weight. (*See, e.g.*, column 7, lines 27-30). Applicants respectfully submit that one of skill in the art reading Kennepohl *as a whole* would utilize sulfur in an amount of at least 10% by weight. Applicants submit that such an amount of sulfur is very different from the claimed amount of sulfur of 0.1 to 2.0% by weight of the coating material. Thus, it is respectfully submitted that one of skill in the art reading Kennepohl would not arrive at the roof covering claimed in claim 9. Miller and Williams do not teach or even suggest the inclusion of elemental sulfur for any purpose. Accordingly, it is respectfully submitted that claim 9 is non-obvious and patentable for this additional reason.

Also, Applicants respectfully submit that Williams does not teach or suggest a roof covering that includes glass fibers sized with a sizing that includes a film forming polymer, a coupling agent, a lubricant, and a bonding material that bonds to the fiber material and the sulfur. Indeed, Williams is silent with respect to any teaching or suggestion of a sizing composition that includes a film forming polymer, a coupling agent, a lubricant, and a bonding material. As discussed above, it is respectfully submitted that Williams fails to teach or suggest a sizing composition at all. Miller and Kennepohl are silent with regard to any kind of sizing composition that includes a bonding material. Accordingly, it is respectfully submitted that the combination of Miller, Williams, and Kennepohl would not result in the claimed invention for this additional reason.

Further, Applicants submit that there is no motivation for one of skill in the art to arrive at the roof covering based on the disclosure of Miller, Williams, and Kennepohl. To establish a *prima facie* case of obviousness, there must be some motivation, either within the reference or in the knowledge of those of skill in the art, to modify the reference or combine the references' teachings, there must be a reasonable expectation of success, and the prior art



references must meet all of the claim limitations. (*See, e.g., Manual of Patent Examining Procedure*, Patent Publishing, LLC, Eighth Ed., Rev. 6, August 2007, §2142).

It is respectfully submitted that one of ordinary skill in the art would have no motivation to arrive at a roof covering based on the teachings of Miller, Williams, and Kennepohl. Kennepohl simply does not teach or suggest the inclusion of elemental sulfur in a coating material in an amount from about 0.1% to about 2.0% by weight of the coating material as claimed in claim 9. Indeed, one of skill in the art reading Kennepohl would arrive at a roof covering that contains a coating material that includes sulfur in an amount far greater than 2.0% by weight because Kennepohl, as a whole, clearly teaches that the sulfur is present in the asphalt in an amount from 10-55% by weight. Miller and Williams are silent with regard to any teaching or even a suggestion of the inclusion of sulfur in the coating material. None of Miller, Williams, and Kennepohl teaches or even suggests the claimed sizing composition. Without some teaching or suggestion, there can be no motivation, and without motivation, there can be no *prima facie* case of obviousness.

Also, as discussed above, none of Miller, Williams, or Kennepohl teaches or suggests inclusion of elemental sulfur in a coating material in an amount from about 0.1% to about 2.0% by weight of the coating material or the claimed sizing composition. Therefore, Applicants respectfully submit that Miller, Williams, and Kennepohl, alone or in any combination, fail to teach all of the claim limitations set forth in claim 9. Accordingly, it is submitted that a *prima facie* case of obviousness has not been established for this additional reason.

With respect to claims 10-15, 17-19, 21, 23, 25, and 29-31, Applicants submit that because independent claim 9 is not taught or suggested by Miller, Williams, and Kennepohl and claims 10-15, 17-19, 21, 23, 25, and 29-31 are dependent upon claim 9 and contain the same elements as claim 9, dependent claims 10-15, 17-19, 21, 23, 25, and 29-31 are also not taught or suggested Miller, Williams, and/or Kennepohl.

In light of the above, Applicants submit that claims 9-15, 17-19, 21, 23, 25, and 29-31 are not obvious over Miller in view of Williams and Kennepohl and respectfully request that this rejection be reconsidered and withdrawn.

### **Conclusion**

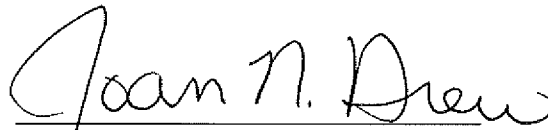
In light of the above, Applicants believe that this application is now in condition for allowance and therefore request favorable consideration.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

If necessary, the Commissioner is hereby authorized to charge payment or credit any overpayment to Deposit Account No. 50-0568 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

Date: May 5, 2009

  
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